Operationalizing TIGER NI Competencies for Online Assessment of Perceived Competency

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Abstract

Competencies in nursing informatics (NI) are needed by every nurse. The TIGER Initiative published a set of NI competencies for every nurse in 2009. A research project focused on using these competencies is underway. A systematic instrument-development process is used to adapt these competencies for use in an online instrument. Results of a modified Delphi method, content-validity assessment, and pilot testing are related. Plans for ongoing research are shared.

Introduction

Nurses practicing in all domains need to be competent in selected aspects of nursing informatics (NI). In 2009, The TIGER Initiative published a set of basic NI competencies for all nurses[1]. Measures to assess these competencies are needed. This research project is focused on developing and implementing a self-assessment of NI competencies, based on the TIGER competencies. In this presentation, development of the instrument is described

Background

Competency is a concept applicable to multiple situations. At its most basic, competency denotes having the knowledge, skills, and ability to perform or do a specific task, act, or job. Depending on the context, competency can refer to adequate or expert performance. For this research, competency is used to mean adequate knowledge, skills, and ability.

For many years, private and public organizations have been advocating the development of informatics competencies for all healthcare professionals. Nursing informatics competencies have been identified through formal research and collaborative work of experts. The impetus for developing this self-assessment came from curriculum development for a nursing informatics specialization track in a master of science in nursing (MSN) program. Discussions with NI faculty and other faculty led to the desire for an instrument that could be used for all graduate students at the beginning of their program of study.

The scholarly literature was examined for research-based NI competencies. A very limited number of such studies were found. Grobe[2] reported the results of a consensus process within the International Medical Informatics Association Working Group Eight (Nursing Informatics) Task Force on Education. Staggers, Gassert, & Curran[3] published the results of a Delphi study that produced a research-based master list of informatics competencies for nurses, differentiated by four levels of practice. Yoon & Bakken[4] described the testing of a self-assessment instrument constructed from a combination of published sources and author-developed items and designed for students in a specific course. The TIGER Initiative competencies came from a consensus process involving extensive review of the literature and a survey of nurse informaticists. Because the research team supports the work of TIGER and because an existing research-based instrument for assessing NI competencies of nurses in general was not available, this project was launched to adapt the TIGER NI competencies.

The set of nursing informatics competencies published by the TIGER Initiative[1] contains three categories of competencies: basic computer skills, information literacy, and clinical information management. The basic-computer-skills category was drawn from the European Computer Driver License (ECDL) and includes 108 non-duplicated items. Information literacy is addressed by 47 items adapted from the American Library Association's information-literacy standards. The Health Level Seven electronic health record system functional model's direct-care components were adapted to form 76 items for the clinical information management category.

Methods

The sets of competencies described above (basic computer skills, information literatcy, and clinical information management) were reviewed by the researchers, with each researcher reviewing one set. Duplicative items were

removed. The first round of reviews resulted in minimal change to two categories; in the clinical-information-management category, items with similar content were combined.

Three experts in nursing informatics practice, research, and education with peer-reviewed publications and presentations in their background served as expert reviewers of the revised set of competencies. These expert reviewers examined all three sets, noting items to be retained and items to be added.

A third round of reviews, by an additional three nursing informatics experts, was conducted to establish content validity, using the CVI as described in Waltz, Strickland, and Lenz[5]. Content-validity data identified items for retention, leading to shorter competency sets.

An online pilot-test of the resulting competency sets is planned for the first quarter of 2012. This will be conducted via an online survey, with members of an online list serve invited to participate. Reliability estimates and item analysis of data from the pilot test will be used to further refine the instrument.

Results

In the second review, three content experts independently confirmed that all of the items in each set should be retained. Table 1 displays these results.

Table 1. Competency sets before and after Delphi review

Competency Set	Number of Items Before Delphi	Number of Items Post-Delphi
Information Literacy	42	42
Clinical Information Management	12	12
Basic Computer	99	99

The content- validity assessment resulted in calculation of a content-validity index (CVI) for each set. These values demonstrated moderate validity for each category. In Table 2, the calculated CVI for each set are displayed. The closer a CVI is to 1.0, the stronger is the estimate of content validity.

Table 2. CVI for each competency set

Competency Set	CVI
Information Literacy	0.75
Clinical Information Management	0.64
Basic Computer	0.52

Discussion

The set of nursing informatics competencies presented by the TIGER Initiative were not written in a format useful for testing and were too numerous. Review of the items for duplicates resulting in some reduction in number. A second review of non-duplicated items resulted, surprisingly, in no candidate items for deletion. Following this review, items were re-worded to be behavioral and unique in content. A third review by NI experts for assessing content validity led to a significant reduction in items, based on the experts' classification of items as relevant versus not relevant. These results range from just above .5 to .75, showing weak content validity (basic computer literacy) to robust validity (information literacy. Removal of items judged not relevant raises the score on each set to 1.0. A reduced set of items have been identified for each category. This compilation of items will be used in pilot testing.

Conclusions

TIGER-recommended competencies establish a foundation for developing a self-assessment of perceived NI competencies. The TIGER competency sets required some revision to incorporate measurable behaviors. After one revision, the competency sets demonstrated moderate content validity. Removal of items that were not rated as relevant reduced the number of items in each competency set and improved the content validity for each set. Pilot testing will be conducted to further the refinement and usability of this instrument.

References

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